



# NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

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## MBA PROFESSIONAL REPORT

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### ANALYSIS OF SOURCE SELECTION METHODS AND PERFORMANCE OUTCOMES: LOWEST PRICE TECHNICALLY ACCEPTABLE VS. TRADEOFF IN AIR FORCE ACQUISITIONS

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December 2015

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**ANALYSIS OF SOURCE SELECTION METHODS AND PERFORMANCE  
OUTCOMES: LOWEST PRICE TECHNICALLY ACCEPTABLE VS.  
TRADEOFF IN AIR FORCE ACQUISITIONS**

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**December 2015**

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**ABSTRACT**

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## LIST OF ACRONYMS AND ABBREVIATIONS

AFICA	Air Force Installation Contracting Agency
AFMC	Air Force Materiel Command
BBP	Better Buying Power
CCB	Contract Change Board
CICA	Competition in Contracting Act
CPARS	Contractor Performance Assessment Report
DOD	Department of Defense
DPAP	Defense Procurement Acquisitions Policy
EVM	Earned Value Management
FAR	Federal Acquisition Regulation
FARA	Federal Acquisition Reform Act
FASA	Federal Acquisition Streamlining Act
FPDS	Federal Procurement Data System-Next Generation
GAO	Government Accountability Office
GPE	Government Point of Entry
HASC	House Armed Services Committee
JAT	Joint Acquisition Team
LPTA	Lowest Price Technically Acceptable
MAJCOM	Major Command
NCMA	National Contract Management Association
OFPP	Office of Federal Procurement Policy
OMB	Office of Management and Budget
PALT	Procurement Administration Lead Time
PCO	Procurement Contracting Officer
PSC	Professional Service Council
PWS	Performance Work Statement
RFI	Request for Information

RFP	Request for Proposals
SAT	Simplified Acquisition Threshold
SOO	Statement of Objectives
SOW	Statement of Work
SSA	Source Selection Authority
SSEB	Source Selection Evaluation Board
SSP	Source Selection Procedures
TINA	Truth in Negotiations Act
USD (AT&L)	Under Secretary of Defense Acquisition Logistics and Technology

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## **I. INTRODUCTION**

According to the Federal Acquisition Regulation (FAR), there is an obligation for any government acquisition team to “deliver on a timely basis the best value product or service to the customer, while maintaining the public’s trust and fulfilling public policy objectives” (FAR 1.102[a]). Acquisition professionals are given significant discretion on exactly how they will meet that mandate. As acquisition teams develop their strategy, one of the most critical aspects to consider is the source selection methodology that will derive the best value outcome for the government.

The FAR outlines a range of source selection methodologies in the best value continuum from the lowest price technically acceptable (LPTA) method at one end to the highest technically rated offeror (HTRO) at the other (FAR 15.101–1). Because the FAR mandates that “price or cost to the Government shall be evaluated in every source selection” (FAR 15.304(c)[1]), the tradeoff method is utilized most often in lieu of HTRO. The source selection methodology to be utilized to achieve best value depends on the complexity of the requirement as well as the importance of price or cost and non-cost factors to be evaluated (FAR 15.101). According to Calisti (2015), “industry contends, overusing LPTA in the long haul will erode the DOD technological edge through low-cost/low-performance solutions; cause performance innovators to depart the market and reduce the quality of goods and services provided” (p. 17). The government on the other hand believes that if LPTA is utilized properly by ensuring that the technical acceptability is at the appropriate level, it can achieve best value more efficiently (Kendall, 2012). This research will analyze contracts that were awarded under both LPTA and tradeoff methods to determine whether a relationship exists between performance outcomes and the source selection method at the Air Force Materiel Command.

### **A. PROBLEM STATEMENT**

There is an anecdotal belief that the government receives a higher quality product or superior level of performance from source selections conducted through the tradeoff

method versus LPTA. However, there is no empirical evidence to prove that this belief is true. There is not a significant body of research to validate whether contractor performance outcomes from tradeoff selection methods result in better value to the government and that outcomes from LPTA methods result in inferior quality.

## **B. PURPOSE**

This research is aimed at determining whether there is a relationship between the source selection method (LPTA or tradeoff) and the subsequent outcome of the contract. Understanding this relationship will help the Air Force better prepare for future acquisitions. The ability to select the proper source selection method for each acquisition scenario will ensure that the right amount of resources get committed to each project which reduces waste in the acquisition process.

## **C. RESEARCH OBJECTIVES AND QUESTIONS**

The objective of this research is to analyze whether a relationship exists between source selection methods (LPTA or tradeoff) and the level of resulting performance outcomes. The contractor's performance results shall be obtained from the Contractor Performance Assessment Reporting System (CPARS) and Earned Value Management System (EVMS). The following questions form the basis for this research:

1. What is the relationship between a particular source selection method and the resulting performance outcome of the contractor?
2. What is the relationship between a particular source selection method and the PALT?
  - i. If there is a positive relationship, can the amount of additional resources utilized for that particular source selection method be quantified in terms of man-hours or in dollars?
  - ii. Does the resulting performance outcome merit the use of that particular source selection method?

## **D. METHODOLOGY**

The methodology for this research include a literature review of certain aspects of the federal contracting process which impacts decisions on source selection methods, the

best value continuum, source selection procedures, controversial issues over the use of LPTA, and the need for source selection training for federal acquisition professionals. Data collection was limited to contracts awarded within the Air Force Life Cycle Management Center (AFLCMC) Directorates located at Wright-Patterson AFB in Dayton, OH. The contracts reviewed for this research were selected based on an award value in excess of \$1 million which is the minimum threshold for CPARS reporting, an award date between fiscal years 2010 and 2013, and competition using either LPTA or tradeoff source selection methods. The Federal Procurement Data System-Next Generation (FPDS-NG) was used to identify a list of contracts awarded between 2010 and 2013. The AFLCMC Directorates were then asked to identify and physically provide all competitively awarded contracts from the list to include source selection material to be analyzed by the research team.

#### **E. BENEFITS**

This research seeks to identify whether a particular source selection method produces better contractor performance outcomes than another as well as to quantify the government resources needed to conduct that particular source selection method. The results of this research will provide federal acquisition professionals with better insight on what outcomes to expect as well as the level of resources required to pursue these source selection methods. These insights will help in future acquisition planning to reduce waste, streamline the acquisition process, and achieve best value.

#### **F. LIMITATIONS**

There are many limitations to this research which impacts the applicability of the results across the DOD. First, the data is only limited to Air Force contracts from one particular Major Command (MAJCOM) and only one contracting center within that MAJCOM. Moreover, due to time and manpower constraints, it was impossible to collect a significant amount of data. Finally, the data collected only contains contracts awarded from 2010 to 2013, which leaves a vast number of contracts that would otherwise qualify for this study unobserved. As more studies of this nature are conducted across other

installations and agencies, the findings will have even greater significance for government acquisition professionals across the DOD.

## **G. ORGANIZATION OF THE REPORT**

This report is organized into five chapters to include this introduction. The next chapter (Chapter II) provides a literature review on the federal contracting process, the best value continuum, source selection procedures, and a discussion of the controversy over increased utilization of the LPTA source selection method in the DOD. Chapter III discusses the methodology for this research to include background information regarding the AFLCMC, the methods used to identify the data, and how the data was obtained. Chapter IV outlines the results and findings of the data analysis as well as answers the research questions. The final chapter (Chapter V) summarizes and concludes this research report with a recommendation for future research.

## **H. SUMMARY**

This chapter examined the background information on the basis of this research to include the problem statement, purpose, research objectives and questions, the methodology, as well as the benefits and limitations of this study. The next chapter is the literature review which provides an overview of statutes important to the government contracting process. Additionally, it presents the best value continuum, highlighting the LPTA and tradeoff source selection methods. Finally, the literature review examines the source selection procedures and discusses the controversial issues over the increased use of LPTA in the DOD.

## **II. LITERATURE REVIEW**

The purpose of this chapter is to provide an overview of general information on the federal contracting process, which influences decisions about the source selection methods to be used in federal procurement. Specifically, this chapter begins with a review of applicable statutes that guide the management of federal contracts and mandate competition as well as efficiency in the federal procurement process. Further, the chapter reviews the various source selection methods available in the best-value continuum, highlighting the important differences between LPTA and tradeoff. Additionally, this chapter examines the DOD source selection procedures, as well as efforts made to reform these procedures to maximize the concept of best value. The chapter concludes with a discussion of a number of controversial issues surrounding the increased use of LPTA and the need for robust source selection training for federal acquisition professionals.

### **A. CONTRACT MANAGEMENT STATUTES AND REGULATIONS**

The regulatory agency responsible for “shaping the policies and practices federal agencies use to acquire the goods and services they need to carry out their responsibilities” (White House, n.d., OMB section para. 2) to the tune of approximately \$530 billion each year is called the Office of Federal Procurement Policy (OFPP). The OFPP was established by Congress to “provide overall direction for government-wide procurement policies, regulations, and procedures and to promote economy, efficiency, and effectiveness in acquisition processes” (White House, n.d., OMB section para. 2). Important statutes provide the foundation for critical aspects of government contracting, particularly decisions about source selection methods to be utilized. These include the Competition in Contracting Act (CICA) and the Federal Acquisition Streamlining Act (FASA).

#### **1. Competition in Contracting Act**

The mandate for competition is the key factor that forces agencies to conduct source selections for procurement actions. Competition not only helps the government achieve best value at a fair and reasonable price, but it is also vital to the small business

program, the defense industry, and the economy. The CICA, enacted in 1984, requires that all contemplated actions leading to the award of contracts must be entered into a full and open competition (Manuel, 2011). FAR 6.101 prescribes that

contracting officers shall provide for full and open competition through use of the competitive procedures(s) contained in this subpart that are best suited to the circumstances of the contract action and consistent with the need to fulfill the government's requirements efficiently. (FAR 6.101[b])

While the promotion of maximum competition is preferred, there are circumstances that prevent the government from being able to compete certain types of requirements or when a sole source environment is more advantageous to the government. In such cases, the FAR “prescribes policies and procedures, and identifies the statutory authorities, for contracting without providing for full and open competition” (FAR 6.3). The source selection methods and procedures for competitive awards are discussed in more detail later in this chapter.

## **2. Federal Acquisition Streamlining Act**

Another notable statute that influences the decision making process for source selection methods by mandating efficiencies in the federal procurement practices is the FASA. Due to the size and complexity of the federal acquisition system, Congress enacted the Federal Acquisition Streamlining Act of 1994 with the goal of achieving efficiencies in the acquisition process (Drelicharz, 1994). According to Drelicharz (1994), the intent of FASA “is to develop a more equitable balance between government-unique requirements and the need to lower the government's cost of doing business” (p. 12). Drelicharz (1994) also reports that

the act addresses these objectives through an emphasis on increasing government-wide reliance on the use of commercial practices, goods and services; streamlining the rules and regulations that govern high-volume contracting activities, which represent an overall low-dollar expenditure; and increasing the selling opportunities for small businesses. (p. 12)

Drelicharz (1994) explained a few of the noteworthy changes brought about by the enactment of the FASA include the following:

- increasing the simplified acquisition threshold (SAT) from \$25,000 to \$100,000;
- enabling government purchase of commercial products on commercial terms;
- standardizing the procurement system throughout all federal agencies; providing notices and debriefs to unsuccessful bidders upon request;
- providing authority to the General Services Board of Contract Appeals (GSBCA) to “dismiss frivolous protests” and “invoke procedural sanctions where a person makes a bad-faith protests” (Drelicharz, 1994, P.15); and
- requiring the establishment of a Federal Acquisition Computer Network (FACNET) as a way to “dramatically streamline the federal purchasing process” (Drelicharz, 1994, p.15).

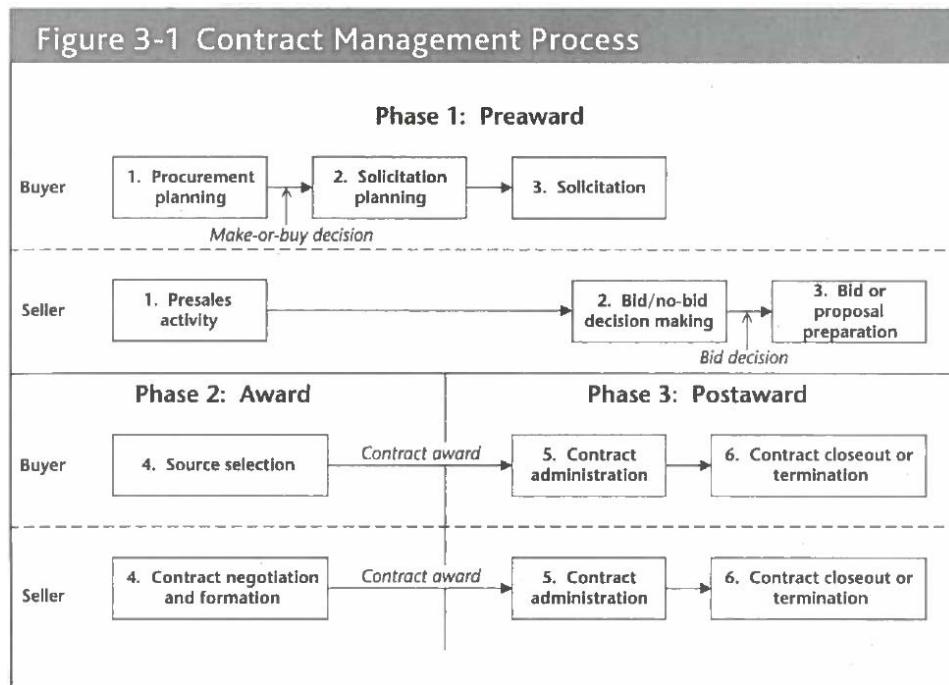
The change that directly impacts source selection methods is the new SAT. The increased SAT allows contracting officers to use simplified procedures for competitive awards up to \$100,000 under FAR 13 in lieu of formal source selection procedures under FAR 15 (Barry, 1995). These statutes not only impact decisions pertaining to source selection methods but also affect how the contract management processes are performed.

## **B. CONTRACT MANAGEMENT PROCESS**

The contract management process is an overarching endeavor that includes a number of activities to include developing a requirement, awarding the contract, and managing relationships with the contractor after award. In his book titled *World Class Contracting*, Garrett defines the contract management process as “the art and science of managing a contractual agreement throughout the contracting process” (Garrett, 2015, p. 15). Understanding this process provides an important foundation to the factors that impact competition, source selection, and best value.

According to Garrett (2015), there are three phases and six primary steps in the contract management process, as shown in Figure 1.

Figure 1. Contract Management Process



Adapted from: Garrett, G. A. (2015). *World class contracting* (6th ed.). Chicago, IL: Wolters Kluwer.

For purposes of this research, we will only focus on the processes of the buyer since we will be analyzing Air Force procurement data as the buying agency. The following paragraphs will briefly describe the three phases along with the purpose of each step and the activities generally performed during those steps.

## 1. Pre-award Phase

According to Garrett (2015), the pre-award phase is mostly concerned with planning for the acquisition, determining what the government needs, what is available in the market, making a decision to provide solutions in-house or outsourcing, and soliciting the market to acquire the needs. Garrett (2015) identifies procurement planning, solicitation planning, and solicitation as the three important steps to focus on during this phase because “this phase is vital in creating successful business relationships” (Garrett, 2015, p. 17). Since using contracts to procure needs involve inherent risks associated with

expectation management of both contracting parties, it is important to perform each step of the pre-award phase with due diligence to minimize this risk (Garrett, 2015).

*a. Step 1: Procurement Planning*

The most important decision to be made during the procurement planning step according to Garrett (2015) is the “make-or-buy decision or outsourcing decision” (Garrett, 2015, p. 20). The primary focus of this step is to determine what the needs of the organization are, when it must be filled, and how (Garrett, 2015). The FAR defines acquisition planning as “the process by which the efforts of all personnel responsible for an acquisition are coordinated and integrated through a comprehensive plan for fulfilling the agency need in a timely manner and at a reasonable cost” (FAR 2.101). Some of the activities performed during this step include defining the needs of the organization, analyzing internal resources and constraints, market intelligence, and risk analysis (Garrett, 2015).

Market intelligence and market research are critical aspects of procurement planning for many reasons. For one thing, they help identify whether the requirement is a commercial need. Additionally, they identify potential companies interested in the requirement which is necessary to make decisions about small business and or socioeconomic set-asides. This information is also necessary to determine the procurement method as well as the source selection method such as LPTA or tradeoff. Hosting industry days or posting sources sought notices on the Government Point of Entry (GPE) are great ways to obtain industry information.

Risk analysis is another important activity to be conducted during the procurement planning step (Garrett, 2015). In order to minimize the various types of risks associated with contracting, “the buyer must identify the sources of uncertainty about contract performance and the risks associated with those uncertainties to write a contract that will address those risks and fairly distribute them between buyer and seller” (Garrett, 2015, p. 73). Risk analysis is a critical activity in the determination of the contract type. Cost, schedule, and performance are just a few examples of risk areas that should be analyzed. There are various methods to avoid, reduce, or transfer risk; however, there are

also tradeoffs or costs associated with them as well. For example, cost risk could be transferred to the contractor by using a firm fixed price type of contract. In turn, the contractor will build the cost of his or her risk into the offering price.

The personnel involved in performing such activities for procurement planning should consist of a multi-functional team. In government acquisitions, a typical acquisition team includes members from the requiring organization, contracting, legal, and finance. The results of these activities should be used to support the critical decision of sourcing within the organization or acquiring the needs from outside (Garrett, 2015). According to Garrett (2015), this make or buy decision is extremely important because the decisions can impact an organization's strategy and may be critical. The activities conducted during the procurement planning process provide for an important foundation for the next step in the preaward phase.

***b. Step 2: Solicitation Planning***

With a fully developed description of what is required and the decision to procure, the next step in the pre-award phase is solicitation planning. The purpose of this step is to develop the documentation necessary to solicit the requirement (Garrett, 2015). Depending on the type of requirement, these documents will describe what the government needs and how the work should be performed or delivered. A draft solicitation or request for proposal (RFP) outlines the quantity and description of the items or services to be performed, the contract specifications such as a statement of work (SOW), applicable clauses, instructions on how offerors should respond, and how proposals will be evaluated. The criteria for evaluating proposals may vary depending on the procurement method selected as well as the source selection method to be utilized.

***c. Step 3: Solicitation***

With the proper documents such as the SOW and the RFP built, the next step in the pre-award phase is the solicitation. The purpose of this step “consists of obtaining information (bids and proposals) from prospective sellers on how project needs can be met” (Garrett, 2015, p. 78). During solicitation, a pre-bid conference may be held and the requirement advertised, among other activities (Garrett, 2015). A pre-bid conference can

be used to ensure that interested vendors fully understand the requirement from both a technical as well as contractual stand point, and to provide clarifications or answer questions which can lead to amendments to the RFP (Garrett, 2015). In a competitive solicitation, an RFP is commonly advertised through the GPE at [www.fbo.gov](http://www.fbo.gov). The pre-award phase ends with the receipt of proposals or bids submitted by vendors on a timely basis as a result of the solicitation process (Garrett, 2015).

## **2. Award Phase**

With all the proposals in house and ready for evaluations, the next phase of the contract management process, the award phase is ready to begin. Source selection is the only step of this phase where many critical activities will be performed. These activities are vital to the successful fulfillment of agency needs through a contract (Garrett, 2015). The government's goal during this phase is to make an award to an offeror that can meet the buyer's needs at the best value. The DOD Source Selection Procedures are the most utilized approach to making such awards in government acquisitions.

### ***a. Step 4: Source Selection***

Source Selection is the process of evaluating the proposals received in order to select the right offeror to fill the needs. For competitive awards, the methods generally used to make selections are LPTA or tradeoff depending on how well the requirement is defined (FAR 15.101). According to Garrett (2015), "the process used to accomplish this varies dramatically depending on the company, the products or services involved, the complexity of the procurement, and many other factors" (p. 138). The key to evaluating proposals successfully in government acquisitions is to ensure that the evaluation factors presented in Section M of the solicitation is followed exactly as prescribed. A few of the commonly evaluated factors in government requirements are price or cost, technical approach, and past performance. Tools such as contract negotiation, weighting systems, screening systems, and independent estimates may be used to evaluate these factors during the source selection process to achieve the optimum outcome, which is a best value contract (Garrett, 2015).

### **3. Post Award Phase**

An established contract with a selected vendor ready to perform marks the beginning of the post-award phase of the contract management process. This final phase involves two steps to ensure that all terms and conditions of the contract are carried out properly and that the contract gets closure upon performance completion or termination (Garrett, 2015). All parties involved in the contract will need to stay in constant communication in order to achieve the desired outcomes of the contract through performance, progress, and contract compliance monitoring (Garrett, 2015).

#### **a. Step 5: Contract Administration**

Contract administration, according to Garrett (2015), “is the process of ensuring that each party’s performance meets contractual requirements” (p. 140). Success depends on full comprehension of the requirements and responsibilities of both parties; therefore, the contract should be carefully studied by all affected personnel and organizations on both sides (Garrett, 2015). The contract administration process involves many activities with a variety of tools and techniques to help perform these activities effectively. In their book titled *Management of Defense Acquisition Projects*, Rendon and Snider (2008) offer four techniques typically utilized in the government contract administration process which includes:

1. Conducting a pre-performance conference,
2. Monitoring the contractor’s work results,
3. Measuring contractors performance, and
4. Managing the change-control process (Rendon & Snider, 2008, p. 176).

These techniques are designed to ensure that all parties are standing on common ground as it relates to the requirements, responsibilities, processes, and protocols that both parties will follow to resolve any conflicts or disputes until the contract is ready for closeout.

**b. Step 6: Contract Closeout**

The sixth and final step of the contract management process deals with closeout or termination. According to Garrett (2015), “a contract can end in one of three ways: successful performance, mutual agreement, or breach of contract” (p. 159). Regardless of whether a contract ends due to successful completion or termination, the closeout process must ensure that all administrative matters such as final payments or settlements are paid and that documents necessary to closeout the contract are received (Garrett, 2015). In government acquisitions, FAR 4.804 outlines the responsibilities for carrying out the closeout process which primarily focuses on the acceptance of the good or service, payment to the contractor, and the statutory timelines for conducting the closeout.

The contract management process shows the important roles each of the phases and steps play in government acquisitions. Most importantly, this process clearly shows that best value cannot be achieved through just one single phase or step. The extensive leg work performed prior to and after the source selection phase of the entire contract management process influences the objectives of achieving best value. The next section provides an overview of the best value concept and the best value continuum as prescribed by the FAR.

**C. BEST VALUE AND BEST VALUE CONTINUUM**

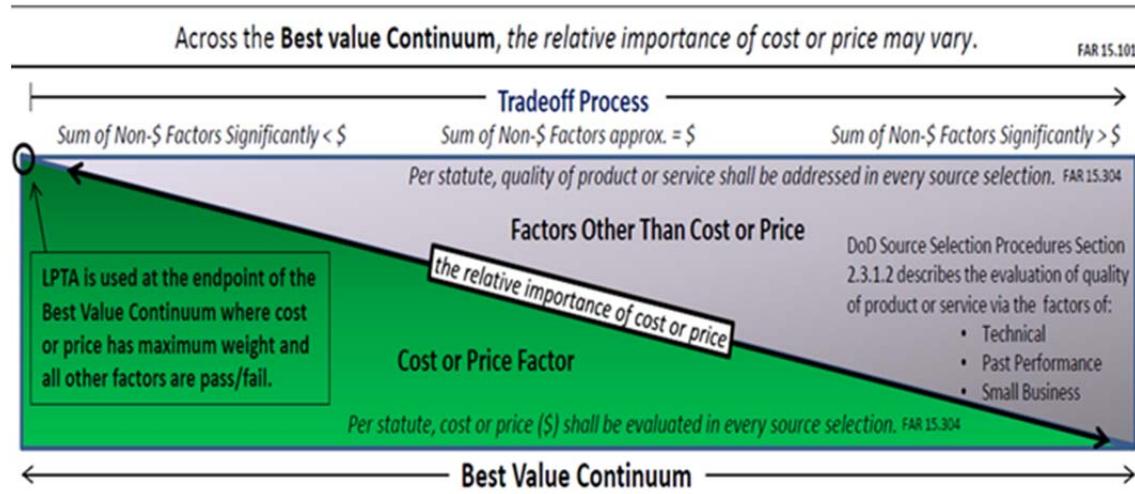
The underlying goal of every contract in the federal government should be to acquire a product or service that provides the “best value.” The FAR defines *best value* as an “expected outcome of an acquisition that, in the government’s estimation, provides the greatest overall benefit in response to the requirement” (FAR 2.101). It is important to note that best value is not always achieved by awarding to the lowest priced bidder. Certainly, there are instances where price should be, and is, the overarching factor that determines the winning bid. Conversely, there are times when factors other than price or cost, such as a technical approach to complex requirements or exceptional past performance records, garner additional consideration by the acquisition team as a way to obtain the best product or service.

In order to address the myriad degrees of complexity in government requirements, the FAR lays out distinct methods by which best value can be achieved through the use of the best value continuum. The interaction of price and non-cost factors that affect the source selection methods to be utilized according to the best value continuum is clearly described in the FAR:

An agency can obtain best value in negotiated acquisitions by using any one or a combination of source selection approaches. In different types of acquisitions, the relative importance of cost or price may vary. For example, in acquisitions where the requirement is clearly definable and the risk of unsuccessful contract performance is minimal, cost or price may play a dominant role in source selection. The less definitive the requirement, the more development work required, or the greater the performance risk, the more technical or past performance considerations may play a dominant role in source selection. (FAR 15.101)

According to the best value continuum, as seen in Figure 2, the relative importance of price as compared to non-cost factors determines whether the LPTA or tradeoff method should be used.

Figure 2. The Best Value Continuum



Adapted from: Best value continuum. (n.d.). In *ACQuipedia*. Retrieved from <https://dap.dau.mil/acquipedia/Pages/ArticleDetails.aspx?aid=5201f734-3bce-4c5f-a5a3-47551df77ea5>

The LPTA method is at one end of the continuum with the heaviest emphasis on price or cost as the most important factor. The tradeoff method is a process that moves away from the LPTA method on the continuum as the sum of non-cost factors such as technical, past performance, and or small business plan becomes equally important or more important than price or cost.

### **1. Lowest Price Technically Acceptable**

The ideal situation for using the LPTA method is for those requirements that are well defined and where “the solicitation provides the evaluation factors and significant subfactors that establish the requirements of acceptability” (Rendon & Snider, 2008, p. 174). One aspect that makes the use of LPTA desirable over tradeoff is the ease with which technical evaluations can be conducted. Since all technical factors are based on an “acceptable” or “unacceptable” basis, the award is simply made to the bidder offering the lowest price with an acceptable rating on all technical factors.

The FAR states that an LPTA approach is acceptable only when the government believes that “best value is expected to result from selection of the technically acceptable proposal with the lowest evaluated price” (FAR 15.101–2). Considering this definition, the LPTA method is best suited for situations where the government would not realize any additional value by paying higher prices for non-cost factors that exceed minimum needs (OUSD[AT&L], 2011). This is primarily the case in acquisitions for non-complex or commercially available products or services.

### **2. Tradeoff Process**

When contemplating complex acquisitions with a degree of risk that can impact cost, schedule, or performance, which is deemed harmful to the program, the best source selection method is the tradeoff. While this is considered a more resource-intensive approach to procuring goods and services, it allows the government to pay higher prices for reduced performance risk, and/or greater technical capabilities, which may provide better overall value. According to the FAR, “a tradeoff process is appropriate when it may be in the best interest of the government to consider award to other than the lowest priced offeror or other than the highest technically rated offeror” (FAR 15.101–1).

The tradeoff method of source selection is a process that “allows the government the flexibility to award to an offeror anywhere on the best-value continuum between the lowest priced technically acceptable offeror and the highest technically rated offeror” (Rendon & Snider, 2008, p. 175). The FAR gives acquisition professionals a broad discretion of which evaluation factors and significant subfactors can be used in solicitations so long as these factors “are tailored to the acquisition,” “represent the key areas of importance and emphasis to be considered in the source selection decision,” and “support meaningful comparison and discrimination between and among competing proposals” (FAR 15.304). Non-cost factors that are typically used in the tradeoff process include, but are not limited to, adherence to the solicitation, superior technical approach, relevant and recent past performance, small business subcontracting plan, professional qualification, risk reduction plan, and the ability to meet or exceed the schedule.

#### **D. DEPARTMENT OF DEFENSE SOURCE SELECTION PROCEDURES**

Regardless of the source selection method (LPTA or tradeoff) used to acquire goods and services, all competitive awards under FAR 15 must follow the DOD standardized Source Selection Procedures (DOD, 2011). In November 2008, John J. Young, the Undersecretary of Defense for Acquisition, Technology, and Logistics (USD[AT&L]), established the Source Selection Joint Analysis Team (JAT; USD[AT&L], 2011). The primary charge for the JAT was to “standardize the methodology and approach the Department uses to conduct competitively negotiated source selections” (USD[AT&L], 2011, p. 1). It took the JAT over two years to develop a robust, standardized approach to conducting source selections; the use of these procedures became mandatory across the DOD as of July 2011 (USD[AT&L], 2011).

The Source Selection Procedures give acquisition teams a start-to-finish road map of the entire source selection process. It begins with a statement of its purpose, outlines the procedures, defines the roles and responsibilities of each source selection team member and provides a standardized listing of all documents that should be used during the process (DOD, 2011). When referenced properly, the DOD Source Selection Procedures should help agencies achieve successful source selection results, shield the

agencies from sustainable protests, and help achieve the goal “to ensure the Department’s source selection process delivers quality, timely products and services to the Warfighter and the Nation at the best value for the taxpayer” (DOD, 2011, p. 1).

## **E. ACQUISITION REFORM**

Prior to the implementation of a standardized DOD source selection guide, the process for source selection and the concept of best value have gone through several iterations of acquisition reform throughout the years. Some of the earlier attempts started in 1981 through the Carlucci acquisition reform initiatives and later through the FASA, the FARA, and the Better Buying Power (BBP) initiatives (Fox, 2011).

One of the early attempts to redefine and clarify the best value concept was through the FASA. As mentioned earlier, this act focuses on simplifying and reforming acquisition laws in order to achieve efficiencies in the acquisition process. A portion of this act emphasized the concept of best value, which allowed agencies to award contracts to higher-priced offerors based on a tradeoff of evaluation factors (FAR 15.101–1). The act, however, missed a couple of important issues according to Fox (2011), “for example, instead of giving procuring offices the freedom to use innovative methods and their own judgment to obtain the ‘best value’ for their organizations, the bill included new restrictions and oversight” (p. 166). Furthermore, “it provided no simplification or streamlining at all for contracts valued over \$100,000” (p. 166).

While the FASA was a good starting point for much needed acquisition reforms, there has been conflicting emphasis on the latitude given to contracting officers in source selections. With the passage of the FARA, which mandates “that full and open competition in government contracting be implemented in a way that is consistent with the need to fulfill efficiently the government’s requirements” (FARA, n.d., para. 1), contracting officers gained more discretion to “limit the number of proposals in the competitive range”, which promotes source selection efficiency. This latitude to limit the number of proposals to the highest rated bidders is deemed “one of the most significant changes in the government contracting area and one of the most controversial” (para. 2).

A renewed focus on source selections took place with efforts to standardize the process across the DOD. The idea to create the JAT was prompted by a report to Congress by the secretary of defense on the Acquisition Transformation Initiatives (OSD, 2008). One of the recommendations was to “change existing source selection guidance to enhance communication to industry” in order to “improve everyone’s knowledge and understanding of the process and seeks to avoid protests and misunderstandings” (p. 21). Prior to the implementation of the DOD Source Selection Procedures, each service used agency-specific regulations and their own interpretations of FAR 15 procedures. This practice made it cumbersome and confusing for industry wishing to participate in source selections across the DOD. For example, a supplier participating in multiple source selections across different agencies and navigating the apparent and not so apparent differences in the way each agency conducted source selections could have been frustrated. The standardization of source selection procedures across the DOD is also important for obtaining better research data. With all agencies following the same procedures, the outcomes of each source selection can be documented and studied for potential trends.

The Better Buying Power (BBP) initiatives beginning with 1.0 introduced in 2010 began a new series of acquisition reforms focused on achieving efficiency and improving acquisition processes across the DOD (Carter, 2010). It was not until BBP 2.0 launched in 2012, however, that reform initiatives addressed best value concepts. In his memorandum, Kendall (2012) outlines how this can be achieved:

The Department needs to improve its ability to define the value to the Department of performance that is above minimum levels so that it can make appropriate source selections and so that industry can bid intelligently. This will spur innovation by providing a predictable basis by which companies can bid enhanced performance with the knowledge that any increased costs are within an acceptable range. (pp. 3–4)

Recently, the DOD’s focus on “best value” was highlighted again in the release of BBP 3.0. This update sought to “provide clear and objective ‘best value’ definitions to industry” (Kendall, 2015b, p. 18). This effort is included within the “Incentivize

Innovation in Industry and Government” initiative, and Kendall (2015b) provides the following general guidance:

This BBP 3.0 initiative builds on the work started in BBP 2.0 to provide industry with information on the value, in monetary terms, of higher levels of performance than minimally acceptable or threshold levels. Without this information, the default position will be to bid to the lowest acceptable level of performance. With this information, industry will know what the competitive effect of offering higher performance will be and can bid accordingly. (p. 18)

Kendall espoused that the DOD would “focus on how to more effectively monetize best value and publicize relevant case studies” (Kendall, 2015b, p.18). Specific actions include: (1) updating the DOD Source Selection Procedures by May 2015 to include the Best Value process manual; and (2) ensure that “best value” definitions are “objective and stated in monetary terms as much as possible” (Kendall, 2015b, p.18).

In addition to best value concepts, the use of LPTA also entered the spotlight based on concerns from industry. Even before the use of LPTA was discussed in BBP 2.0, the drumbeat from LPTA detractors was growing steadily louder. To address these growing concerns, Kendall followed up with a memorandum titled “Appropriate Use of Lowest Priced Technically Acceptable Source Selection Process and Associated Contract Type” (Kendall, 2015a). The bottom line of his memorandum is to address the fact that inappropriate use of particular source selection methods can undermine the government’s efforts to achieve best value (2015a).

## **F. CONTROVERSY OVER USAGE**

Words such as “sequestration,” “economic recession,” and “budget deficit” have been main topics of headline news for several years. Young (2015) asserted that the DOD budget decreased steadily over the past several years since 2010 due to the winding down of conflicts in Iraq and Afghanistan and Congress passing the Budget Control Act of 2011, which imposes caps on discretionary spending also known as sequester. According to Senator Jeff Sessions (2011) in a United States Senate Budget Committee report, the Budget Control Act is designed to cut defense spending by approximately 20% while

increasing non-defense spending by about 50%, “sequester affects defense more than other programs” (p. 1).

In response to the national budget crisis, the former USD(AT&L), Ashton Carter (2010), emphasized the need to “do more without more” (p. 1) in *Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending*, a memorandum for all acquisition professionals. With the budget getting tighter each year, the DOD must find ways to achieve efficiencies across the board, especially within the realm of contracting processes and procedures. While it is unclear whether the budget constraints caused the increase in the DOD’s utilization of the LPTA source selection method, a 2014 GAO report indicated that “DOD increased its use of LPTA from fiscal year 2009 to fiscal year 2013 for contracts with obligations of \$25 million or more” (p. 11). The DOD is also reported to be the top user of the LPTA procurement method, according to Langan (2013).

This increase in the use of LPTA by government procurement offices is stirring up controversy between industry and government. As cited in Gansler and Lucyshyn (2013), “The National Defense Industrial Association (2012) named improper use of LPTA sourcing as one of its ‘top issues’ of 2012, while the Professional Services Council (PSC) called monitoring the frequency and misuse of LPTA a ‘2013 Policy Priority’” (p. v). According to the GAO (2014), the DOD is the biggest spender of the federal budget out of all other departments; it “obligated about \$310 billion in fiscal year 2013 to acquire products and services needed to support its missions” (p. 1). This fact puts the DOD’s acquisition practices under a microscope, leading to high levels of scrutiny and criticism from all stakeholders, especially the defense industry and Congress. The issues surrounding the use of LPTA are making greater noise in the media and becoming the subject of leadership attention in recent years.

## **1. Is LPTA Used Appropriately?**

With increased use of the LPTA method for contracts above \$25 million, critics (mainly defense contractors) question whether such methods are being used appropriately. FAR 15.101 outlines the various methods within the Best Value

Continuum whereby agencies can choose “any one or a combination of source selection approaches” (FAR 15.101) to obtain best value. While the FAR outlines that “in different types of acquisitions, the relative importance of cost or price may vary” (15.101), the ultimate decision to use either the LPTA or tradeoff method depends on the contracting officer’s discretion. To provide further guidance on the issue, Kendall (2015a) pointed out in his DOD-wide memorandum that

LPTA is the appropriate source selection process to apply only when there are well-defined requirements, the risk of unsuccessful contract performance is minimal, price is a significant factor in the source selection, and there is neither value, need, nor willingness to pay for higher performance. (p. 1)

Additionally, the new DOD (2011) Source Selection Procedures suggest that

LPTAs may be used in situations where the government would not realize any value from a proposal exceeding the government’s minimum technical or performance requirements, often for acquisitions of commercial or non-complex services or supplies which are clearly defined and expected to be low risk. (p. A-1)

Although there are published policies and guidance regarding the appropriate use of LPTA, Weckstein and Delgado (2012) claimed that “the legal framework on use of LPTA remains unworkably vague” (p. 2) and that there is no “firm standard for when LPTA can and cannot be used” (p. 3). For instance, it is up to the contracting officer’s discretion to decide the source selection method based on how complex and or risky he or she perceives a project to be. There is a lack of clear guidance about what makes a contract “complex” or “risky.” Weckstein and Delgado (2012) also argued that “there must be some limit to a contracting officer’s discretion, a point at which the decision to use LPTA sourcing becomes unreasonable in relation to agency needs and the government’s interest” (p. 3).

Aside from a perceived lack of clarity in prescribing the proper use of various source selection methods, the DOD is criticized for using LPTA “where marginal product quality is a differentiator (such as medical products used to care for soldiers) and in the outcome-based services industry” (Crusius, 2015, para. 3). Referring to the government’s use of LPTA to procure such services, Crusius (2015) made a comparison by asking the

question “Would you like it if your children’s school hired its teachers on an LPTA basis?” (para. 3). Gansler and Lucyshyn (2013) also voiced their concern about the fact that “LPTA source selection has been expanded to the procurement of complex hardware and high-knowledge-content professional services” (p. 9). They stated that the use of LPTA “can be inappropriate at times, especially when the technology in question is complex or unprecedented, or when lives are at stake” (p. 4). Gansler and Lucyshyn (2013) also argued that high-end, complex services deserve a “thorough examination of ‘trade-offs’ between cost and non-cost factors” (p. 2). Finally, Lohfeld (2012) remarked that “procurements get into trouble when the LPTA criteria is applied to technical and professional services bids because the work is complex, minimum acceptable technical and performance requirements are difficult to describe, and the consequences from failure can be considerable” (p. 1).

Many of the articles, including Gansler and Lucyshyn’s (2013) study, point to the State Department’s personal security contract for the U.S. Embassy in Kabul, Afghanistan, as an example of a complex service procured through the LPTA method, which should have been acquired through tradeoff. According to the Commission on Wartime Contracting in Iraq and Afghanistan (CWC, 2009),

unlike other federal agencies, the U.S. Department of State is forbidden by law to select anything but the lowest price and ‘technically acceptable’ offer when awarding contracts to protect its overseas buildings—even if this means passing up offers from firms offering higher quality and better experience. In contingency operations like those in Iraq and Afghanistan, this prohibition can have negative consequences for security, wartime mission objectives, and America’s image. (p. 1)

Accordingly, the CWC (2009) reported that the winning bid was \$110 million lower than its competitor and the contract was plagued with a “litany of complaints about poor contract performance and behavior by AGNA, the company’s in-country leadership team was slow to respond to problems and improperly performed their duties as a contingency contractor” (p. 4). The contractor’s performance deficiencies consisted of failing to provide the proper number of trained, qualified guards; inability of the guards to communicate with embassy personnel and visitors due to language barriers; and

unacceptable food services, inadequate documents, training, and uniforms for new employees, which were all requirements of the contract (CWC, 2009)

High profile cases such as the State Department's Kabul embassy example along with a few others such as the Air Force's KC-X program and the Navy's next generation enterprise network contract discussed by Gansler and Lucyshyn (2013), leave opponents of LPTA with a perception that the method is widely and inappropriately used across the DOD. However, the 2014 GAO report titled *Defense Contracting: Factors DOD Considers When Choosing Best Value Processes Are Consistent with Guidance for Selected Acquisitions* paints a much different picture. According to the results of this study, the "DOD used the tradeoff process most often in our sample to acquire services, including those related to construction projects, aircraft maintenance, and other support services, regardless of obligation amount" (GAO, 2014, p. 10). The report also claims that the LPTA method was used primarily for the purchase of "commercial products such as fuel" (p. 10) for contracts at or above \$25 million. While it is true that the use of LPTA in DOD contracts increased over the past few years, its application is found to be consistent with guiding policies and procedures appropriate for the level of risk and complexity of the projects awarded under its method.

## **2. Does LPTA Provide Best Value?**

The biggest issue with increased use of the LPTA method is that it is perceived by critics to be the cheapest, short-term focused solution, which is not a best value approach to procurement. According to Meagher (2012), "Lowest Price Technically Acceptable is commonly viewed as an alternative to best value" (para. 2) even though the FAR clearly outlines that it is one of the methods that can be used to achieve best value. The FAR specifically states that LPTA is appropriate "when best value is expected to result from the selection of the technically acceptable proposal with the lowest evaluated price" (FAR 15.101-2). Yet industry argues that best value cannot be achieved when price becomes the biggest discriminator, with technical capabilities and company experience seated in the back on a pass or fail basis.

With regard to best value, Gansler and Lucyshyn (2013) asserted that ignoring such important non-cost factors and focusing on lowest price could lead to awarding contracts to firms with “fewer, or less experienced, employees; unreliable supply chains; or less effective quality control processes—factors that may not be evident in the proposal, and, even if they are, such factors are typically excluded from consideration under LPTA” (p. 2). According to Lohfeld (2015), “overemphasizing cost causes bidders to be much more aggressive at risk taking, and bidders will underestimate their cost of performance in an effort to be the lowest priced, technically acceptable bidder” (para. 4). Lohfeld (2015) also emphasized that “in the long run, expected cost savings are erased by cost overruns, contract modifications, show cause letters, and even contract terminations” (para. 4). When contractors are forced to compete on the basis of lowest price, Perkins (2014) opined, this drives contractors to hire the cheapest people they can possibly find and that “projects staffed via LPTA usually end up with the least expensive people meeting minimum levels of education, security clearance and so on. Such people are likely to have trouble with unexpected or complex problems” (para. 4). Most companies in the defense industry seem to agree that “the level of quality or the value provided to the government suffers” (Anderson, 2014, para. 2) when projects are awarded under LPTA.

Industry often argues that not only does LPTA rob the government of long-term value by ignoring important non-cost factors, but that the level of customer service, overall effort, and quality in the short-run is also subpar. With all the profits “squeezed” out of the contractors, anything above the minimum requirement becomes unaffordable (Calisti, 2015). Anderson (2014) compared services received under LPTA to installing the cheapest tires for a car, “they may not last very long, and they could have blowouts that are not covered by warranties, they could cause vibrations at highway speeds due to imbalance but they will allow the car to roll down the road” (para. 2). Anderson (2014) also compared LPTA to achieving a “D” in school, which is the lowest passing grade, and encouraged government contractors to “be diligent in reviewing the solicitation to see if the evaluation will be LPTA or Best Value” (para. 4); if it is LPTA, find out exactly what the “bare minimum” technical acceptable level is and strive for a D (Anderson,

2014). With such a stance, the defense industry believes that quality, creativity, and innovation have no place in a contract awarded under the LPTA method.

### **3. LPTA Leaves No Room for Innovation**

Another consensus among industry with regard to increased use of LPTA is that it leaves no incentive for companies to innovate. With smaller profit margins, companies cannot afford to bring creative and innovative solutions to the table. In a Washington Technology article, Lisa Mascolo (2012) referred to LPTA as “the antithesis of innovative” (para. 3). Innovation plays a crucial role for both the DOD as well as the nation. During an interview, Zachary Fryer-Biggs (2012) captured a quote from the former U.S. defense secretary, Leon Panetta, on the importance of innovation:

We’re depending a great deal on being at the technological edge of the future, Panetta said. I think we even have to leap forward. If we’re going to deal with the kind of challenges we’re going to face, we’ve got to be smart enough, innovative enough, creative enough to be able to leap forward. (para. 6)

Innovation is also the heart of a nation’s economic development and evolution. In a world of global markets, innovation is also the key to obtaining competitive advantage. According to Gansler and Lucyshyn (2013), “it is clear that global markets; technology proliferation; and education in science, technology, engineering and mathematics will drive innovation in defense and other increasingly global industries” (pp. 21–22). However, Gansler and Lucyshyn (2013) worried that “increased reliance on LPTA may also accelerate worrisome national trends,” (p. 21) where “American dominance in scientific and technological innovation will continue to decline” (p. 22). Gansler and Lucyshyn (2013) further asserted that “reducing the demand for new innovation could potentially weaken America’s economy and national security posture” (p. 22).

### **4. Impact of LPTA on the Defense Industry**

While defense spending has been cut across the board, the number of companies in the industry looking to win bids has not changed (Weckstein & Delgado, 2012). With less money to spread around, competition within the industry has been heating up over the past few years (Burnett, 2011). Additionally, the use of LPTA source selection

methods only seem to fuel the fire, further straining companies in the industry, forcing them to take drastic measures such as reducing employee salaries and layoffs (Perkins, 2014). For instance, according to an article by Censer (2014), Wayne Luceroni, the president of Harris IT services, issued a statement during an interview that his company has cut costs, including consolidating seven Northern Virginia offices into one facility in order to “cope with what industry views as increasing price pressure” (para. 16). Furthermore, Young (2015) claimed that

in this new LPTA business environment, savvy management teams have been reorganizing their business development teams and delivery capabilities around new standards. Operationally, contractors have stripped out all sorts of costs; reducing their wrap rates and overall cost of service delivery and product production. In terms of business development, many contractors have turned to outside consultants to assist with ad-hoc proposal development. Their efforts have yielded significantly lower Selling General and Administrative (SG&A) rates, which benefited the government financially on both fixed price and cost-plus programs. (p. 1)

Young (2015) also asserts that the outsourcing of proposal development by contractors is creating new problems for both government and contractor, where contractors are winning bids but unable to deliver performance because they did not write the proposals. As a response, the Department of Veterans Affairs (VA) banned proposal preparation by outside consultants on November 19, 2014, which was protested by a small business on grounds that the ban was “unduly restrictive” (p. 1). While the protest was denied by the GAO, “the implications for small and middle-market contractors are serious. If a company cannot afford to maintain full-time business development employees, it will be at a severe, if not insurmountable, disadvantage for competing on RFPs” (Young, 2015, p. 2). While the VA’s concerns over contract performance risk are legitimate, the GAO’s decision would force smaller firms with limited resources into teaming agreements while larger primes benefit (Young, 2015).

## **5. Leadership Awareness of LPTA Issues**

Proponents of LPTA believe that all the issues discussed thus far are just tactics used by industry to “demonize” the source selection method because it further narrows a

profit margin already impacted by budget cuts (Cox, 2015). Cox (2015) claimed that “contractors would prefer that DOD use a more expensive process called ‘best value,’ which allows them to charge more for features that warfighters usually don’t need,” (para. 4) and further insists that all the industry complaints published in trade reports are “unfounded” (para. 9). The biggest issue over the use of LPTA among industry is that it leads to low quality performance. According to Lohfeld (2012), the key to avoiding quality issues with the LPTA method is to ensure that the standards to meet the minimum technical acceptability is set at a level that meets the customer’s needs. Furthermore, cost and price analysis techniques such as price realism (price is too low) and price competitiveness (price is too high) can be utilized to evaluate proposals that seem too low or risky (Garrett, 2015). The controversy over the use of LPTA, however, is not ignored by Congress or the leaders in the DOD acquisition community. According to the House Armed Services Committee (HASC) Report 232-33 (as cited in Nichols, 2013),

the House Armed Services Committee would have the U.S. Comptroller General conduct a review of [DOD’s] use of source selection processes, including LPTA—and, [i]n conducting the review, ... to obtain the views of defense contractors to gain insight into how the use of LPTA source selection procedures affects business decisions and to identify the unintended consequences, if any, resulting from the use of this approach. (p. 1)

The HASC Report further “directs the Comptroller General to provide the findings of the review, along with recommendations to improve the Department’s contracting practices, to the congressional defense committees by June 30, 2014” (as cited in Nichols, 2013, p. 1). In addition to the Congressional inquiries, Jared Serbu (2014) reported that the USD(AT&L), Frank Kendall, tasked “Randall Culpepper, the Air Force’s top official for services contracting” (para. 3) to lead a review of LPTA usage across the DOD.

## **G. SUMMARY**

This chapter explored general information on statutes and regulations that influence federal contracting and reviewed the phases of the contract management process. Additionally, the difference between LPTA and tradeoff source selection

methods were examined along with the concepts of best value and the best value continuum. The chapter also reviewed the new standardized DOD Source Selection Procedures, as well as some history on previous efforts to reform the federal acquisition process and best value principles. Finally, some controversial issues regarding the increased use of LPTA were discussed to set the stage for why this research is being conducted. The next chapter describes the methodology for this study, including background information regarding the Air Force Life Cycle Management Center, methods used to identify the data, and how the data was obtained.

### **III. METHODOLOGY**

This chapter will discuss the methodology used to locate, collect, and analyze data in order to answer the research questions. This includes a description of the data source, the types of data accessed, and the data collection process which describes the criteria used for selecting contract files and the data collection rubric. The last section describes the analysis protocol that was used to quantify the relationship (if any) between source selection method and contract outcomes such as CPARS ratings and PALT.

#### **A. SOURCE OF DATA**

For this research, we selected Wright-Patterson AFB as the source of data because of its perceived prominence in Air Force acquisition. Wright-Patterson AFB is home to both the Air Force Materiel Command (AFMC) and Air Force Life Cycle Management Center (AFLCMC) which are involved in the acquisition and sustainment of major weapons systems to support the Air Force mission. To most members of the Air Force acquisition community, Wright-Patterson represents the epicenter of procurement and acquisition activity.

On June 4, 2010, a memorandum was issued by the Secretary of Defense, challenging services to “eliminate redundant functions and increase funding for mission functions through efficiency savings” (AFLCMC, 2015, P. 10). The Air Force believed the most prudent approach to meeting the SECDEF’s charge was a restructuring of the command. The decision was made that a reduction from 12 location-specific organizations, each requiring a full staff, down to five mission-based life-cycle centers would be the appropriate way ahead. The “Five Center Construct” as it was dubbed, was designed to “reduce overhead cost and eliminate redundant layers of staff” (AFLCMC, 2015, p. 11). It was also believed that such a structure would allow for more standardized business practices and provide customers with a “single face” for their programs (AFLCMC, 2015, p. 11). AFLCMC is one of the centers that formed as a result of the restructuring.

The AFLCMC was designed to be a “mechanism to bring focused, disciplined and integrated life cycle management to the acquisition of Air Force weapon systems” (AFLCMC, 2015, p. 11). The overarching goal was to achieve savings and better performance by managing the entire life cycle of a system as opposed to its individual parts such as development, testing, production, and support. The belief was that a single center would provide uniform and continuous process improvement at an enterprise level. The first AFLCMC commander, Lieutenant General Clyde D. Moore, developed the following mission statement for the new center: “Delivering affordable and sustainable war-winning capabilities to the U.S. and international partners on time, on cost, anywhere, anytime from cradle to grave”

For this research, contracts from three of the 10 AFLCMC directorates were reviewed. The three directorates were the Agile Combat Support (ACS) Directorate, the Mobility Directorate, and the Contract Execution Directorate. ACS oversees Air Force programs to include metrology and calibration, automatic test systems, combat electronics, electronic warfare, and avionics and simulators (AFLCMC, 2015, p. 15). The ACS contracts reviewed for this study were all within the simulator section. The Mobility Directorate manages the “development, production, testing, deployment, and sustainment of a mobility and training aircraft” (AFLCMC, 2015, p. 17). Finally, the Contract Execution Directorate (PZI) office serves as an organization that provides contractual support to the various directorates spread across the AFLCMC and is primarily focused on providing information technology solutions.

## **B. TYPES OF DATA**

Numerous electronic federal acquisition systems exist, in part, due to federal statutes, regulations, policies, and in response to process improvement initiatives. These systems serve several functions including data collection, data dissemination, documenting contractor performance, and contract document execution. The systems accessed in support of this research include the Contract Writing System (ConWrite), the Federal Procurement Data System–Next Generation (FPDS-NG), the Contractor Performance Assessment Reporting System (CPARS), and the Earned Value Central

Repository. This section explains each system in further detail and highlights the reasons why they were accessed for this study.

### **1. Contract Writing System**

ConWrite is one of several contract writing systems used by the United States Air Force (USAF). ConWrite is a contract document preparation software package that allows users to prepare contracts, solicitations, grants, modifications, and orders for Air Force Materiel Command (AFMC), Air Force Space Command (AFSPC) Product and Test Centers, and the Air Force Research Laboratory (B&ESD, 2015, p. 68). For this research, ConWrite was used to generate a report identifying contracts that met certain parameters. The report was then disseminated to several AFLCMC directorates to verify whether the contract files were available for review.

### **2. Federal Procurement Data System–Next Generation**

FPDS-NG is “a computer-based Federal Procurement Data System for collecting, developing and disseminating procurement data to the Congress, Executive Branch, and private sector” (FPDS, 2015, p. 1). Information is entered into the system through a contract action report (CAR) once a contract action is completed. The system contains comprehensive post-award information pertaining to individual contracts awarded within the federal government. This information includes inputs such as contract type, the extent to which the contract was competed, and the number of offerors, among others. For the purposes of this research, FPDS-NG was used to generate a list of contracts that could be reviewed during the data collection process.

### **3. Contractor Performance Assessment Reporting System**

CPARS is used to document contractor performance and “is one of the tools used to communicate contractor strengths and weaknesses to source selection officials and Contracting Officers” (CPARS, 2015, p. v). Contractor performance is assessed through five broad evaluation areas including Quality, Schedule, Cost Control, Management, and Utilization of Small Business, if applicable to the contract (CPARS, 2015).

CPARS reporting requirements differ between civilian federal agencies and the DOD. Although federal civilian agencies require CPARS reports for systems and non-systems contracts above the simplified acquisition threshold (SAT), the DOD typically requires CPARS reports for contracts at higher dollar thresholds (CPARS, 2015). Appendix A outlines the DOD CPARS requirements based on business sector and dollar threshold.

The DOD CPARS requirements were useful to determine search parameters for contracts in ConWrite and FPDS-NG. CPARS was accessed for this research because contractor performance data is an important post-award outcome.

#### **4. Earned Value Central Repository System**

Earned Value Management (EVM) is a program management practice to assess program status through cost, schedule, and technical performance (PARCA, 2015). Further, the Earned Value Management System (EVMS) “is an integrated management system that integrates the work scope, schedule, and cost parameters of a program in a manner that provides objective performance measurement data” (OUSD[AT&L]/PARCA, 2015).

The DOD requirements for EVM are found in the Defense Federal Acquisition Regulation Supplement (DFARS) Subpart 234.2 and the DOD Instruction (DODI) 5000.02 (OUSD[AT&L], 2015). The EVM reporting requirements are based on contract type and dollar threshold in then-year dollars (Appendix B). Referencing the EVM requirements was useful to determine search parameters for contracts in ConWrite and FPDS-NG. The Earned Value Central Repository was accessed for this research because EVM data is an important post-award performance outcome. It is indicative of a contractor’s ability to manage the cost, schedule, and technical performance aspects of a program (PARCA, 2015).

### **C. DATA COLLECTION**

The data collection process involved travelling to Wright-Patterson AFB to physically review contract files. Contracts were identified by working with AFLCMC to

run a query in both ConWrite and FPDS-NG based on particular parameters. This section explains the efforts made to identify and locate contract files and the spreadsheet rubric used to collect the necessary data.

### **1. Criteria for Identifying Contract Files**

Reports were generated using ConWrite and FPDS-NG to identify contracts for review. Initially, AFLCMC Contracting Directorate (AFLCMC/PK) queried ConWrite based on the following criteria: (1) Contracts closed within the past calendar year (2015), (2) contract value  $>\$1$  million, and (3) ideal sample of 40–60 contracts. AFLCMC/PK was advised that if the initial report did not result in a list of 40–60 contracts based on the aforementioned criteria, an additional query could be accomplished to include all contracts that were within the last year of contract performance (calendar year 2015). The resulting report included a total of 70 contracts that were closed within the past two years. This report was then forwarded to the following AFLCMC directorates to identify and locate any of the contract files: Business & Enterprise Systems (HI), Contract Execution (PZ), Air Force Security Assistance Cooperation (WF), Agile Combat Support (WN), 645th Aeronautical Systems Group (WI), Mobility (WL), and Fighters and Bombers (WW). Unfortunately, many of the contracts listed in that report were unavailable for review because they were either in staging or they were noncompetitive contracts. ConWrite does not offer the ability to query based on competitive versus non-competitive contracts. To expand the potential amount of contracts to review, AFLCMC/PK provided an updated report that included all AFLCMC contracts that were awarded in calendar years 2010 and 2011. This report was much more extensive and included 910 contracts. The report was filtered and sorted for contracts valued greater than \$1 million, which resulted in a list of 55 contracts. This report was also forwarded to the aforementioned directorates. Since reports generated from ConWrite could not identify whether contracts were competitive, a third report was generated using FPDS-NG. AFLCMC/AZ provided the report for all contracts awarded between FY2010–2013, which was then filtered by competitive contracts, resulting in a list of 188 contracts. All three reports were forwarded to the directorates to identify and locate contracts to review.

## **2. Data Collection Rubric**

The data collection rubric is a Microsoft Excel spreadsheet created to capture up to 98 inputs per observation (contract reviewed). This is the same spreadsheet used in the studies conducted by Watson (2015) and Bastola, Findley, and Woodward (2015). The data inputs fell within five broad categories related to the pre-award and post-award contract management phases. The categories are: (1) Basic Information, (2) Acquisition Complexity, (3) Environmental Factors, (4) Outcome Variables, and (5) Other. This section describes each broad category in further detail.

The Basic Information category includes descriptive information for each observation such as the agency, the contract number, the name of the program or requirement, and the NAICS code. This category includes a total of seven data inputs.

The Acquisition Complexity category includes variables such as the contract type, dollar value, source selection method (LPTA or tradeoff), number of evaluation factors, number of contract line item numbers (CLINs), number of offerors, and whether single or multiple award. This category included a total of 41 potential data inputs.

The Environmental Factors category includes variables such as the number of reviews, number of personnel on the source selection team, the number of source selection team locations, and the use of collaboration tools among others. This category includes a total of 13 potential data inputs.

The Outcome Variables category included the procurement administrative lead time (PALT) information encompassing the requirement receipt date, RFP issue date, proposals received date, and contract award date. Additionally, other inputs include whether there was a protest (Yes or No), the level of the protest (if applicable), CPARS ratings, and EVM information. This category includes a total of 30 potential data inputs.

The Other category includes variables such as the number of evaluation notices, the number of rounds of evaluation notices, number of deficiency reports, and the basis for award. This category includes a total of seven potential data inputs.

## D. DATA ANALYSIS

This research aims to determine whether contract performance outcomes such as CPARS ratings, PALT, and EVM (if applicable) are impacted by the choice of using the LPTA or the tradeoff source selection method. This research utilized the same analysis technique used by Watson (2015) and Bastola et al. (2015).

For this analysis, we used two main dependent, or outcome, variables (DVs)<sup>1</sup>: procurement administrative lead-time (PALT) and Contractor Performance Assessment Rating System (CPARS) data. PALT assesses “time to contract” by calculating the number of days between receipt of the requisition and contract award. It is a continuous variable. CPARS serves as a proxy measure of contract success or failure by using the ratings given to each contract once complete. CPARS ratings are given in Likert-style responses where 1=Unsatisfactory, 2=Marginal, 3=Satisfactory, 4=Very Good, and 5=Excellent. In this case, we used a combined CPARS score as the second dependent variable. Specifically, we searched for differences in CPARS ratings between LPTA and Trade-Off acquisition strategies by examining a within-contract average of CPARS Cost ratings, CPARS Quality ratings, CPARS Schedule ratings, and CPARS Business Relationship ratings.

Our model has one independent variable, or IV. Independent variables are those that can be manipulated by the researcher (or user) to evoke a change in the outcome, or DV. In this case, the IV concerns the contract methodology used for the contract: lowest price technically acceptable (LPTA) or Trade-Off (TO). Contracting methodology is a choice made by the “user” (the integrated product team, which includes the Contracting Officer), hence it is considered an IV. Our IV is labeled LPTATO and it is a binary variable where 0=LPTA and 1=Trade-Off.

Finally, there are four covariate variables. Covariates are secondary variables that can also affect the relationship of primary interest: the relationship between the IV and

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<sup>1</sup> EVM data was not available for the contracts that were reviewed.

the DV. Specifically, covariates are variables *other than* the independent variable that potentially affect the outcome variable, or DV. In this case, the covariates are (1) number of evaluation factors (NUMEVALFACTORS), (2) number of reviews (NUMREVIEWS), (3) number of offers (NUMOFFERS), and (4) contract dollar value (VALUE).<sup>2</sup> All are continuous variables. Theoretically, each of the first three covariates could affect the PALT positively (e.g., a larger number of any of the covariates could increase the PALT, or time to contract). Each of the first three covariates may also have a positive effect on CPARS rating. One could argue that a higher number of each of the covariates serves to improve the chances of selecting the “right” or “best” contractor, ultimately improving contract performance (as measured by CPARS rating). In this case, we hope to parcel out the effects of the covariates in order to more clearly see the effect the contracting methodology (LPTATO) has on the outcome variables (PALT and CPARS ratings). It is worth noting that not all of our covariates passed assumption testing, therefore not all were used. More details are provided in Chapter IV.

## **E. SUMMARY**

This chapter discussed the methodology used to locate, collect, and analyze data in order to answer the research questions. This included a description of the data source, the types of data accessed, and the data collection process. The last section described the analysis technique that was used to quantify the relationship (if any) between source selection method and contract outcomes such as CPARS ratings and PALT. The next chapter will discuss the data analysis results.

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<sup>2</sup> One might assume that NUMREVIEWS and VALUE are highly correlated, given the fact that contract dollar value often determines the number and level of reviews through which a solicitation and contract must pass. However, for this data, we found they were not highly correlated ( $r=.03$ ), thus we chose to keep both as covariates.

## IV. DATA ANALYSIS

This chapter describes the data analysis and results using multivariate and univariate analysis of covariance techniques to determine if there are differences in contract outcomes based on source selection methodology. The analysis is further supported by a discussion of the descriptive statistics for each variable, data issues, and assumption testing.

### A. DESCRIPTIVE STATISTICS

Basic descriptive statistics for each variable are shown in Table 1. The table presents three figures for each variable: (1) the total for all the data, (2) the total for LPTA contracts, and (3) the total for tradeoff contracts.

Table 1. Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max	
PALT (days)	23	<b>317.5652</b>	<b>214.7235</b>	<b>50</b>	<b>878</b>	<b>ALL DATA</b>
	10	203.1	141.6054	50	482	<b>LPTA</b>
	13	405.6154	223.9898	72	878	<b>TRADEOFF</b>
Average CPARS Rating	18	<b>3.766667</b>	<b>.639623</b>	<b>3</b>	<b>5</b>	<b>ALL DATA</b>
	5	3.34	.527257	3	4.2	<b>LPTA</b>
	13	3.930769	.6179733	3	5	<b>TRADEOFF</b>
Number of Evaluation Factors	24	<b>2.666667</b>	<b>.5646597</b>	<b>2</b>	<b>4</b>	<b>ALL DATA</b>
	10	2.1	.3162278	2	3	<b>LPTA</b>
	14	3.071429	.2672612	3	4	<b>TRADEOFF</b>
Number of Reviews	22	<b>3.909091</b>	<b>3.66332</b>	<b>1</b>	<b>18</b>	<b>ALL DATA</b>
	9	2.555556	2.068279	1	7	<b>LPTA</b>
	13	4.846154	4.278749	1	18	<b>TRADEOFF</b>
Number of Offers	24	<b>6.833333</b>	<b>5.329709</b>	<b>2</b>	<b>23</b>	<b>ALL DATA</b>
	10	8.1	7.23341	2	23	<b>LPTA</b>
	14	5.928571	3.452185	2	11	<b>TRADEOFF</b>
Contract Dollar Value	24	<b>\$268,000,000</b>	<b>\$595,000,000</b>	<b>\$1,185,396</b>	<b>\$2,300,000,000</b>	<b>ALL DATA</b>
	10	\$3,947,115	\$2,218,574	\$1,185,396	\$6,500,000	<b>LPTA</b>
	14	\$456,000,000	\$732,000,000	\$1,271,044	\$2,300,000,000	<b>TRADEOFF</b>

## **B. DATA ISSUES**

With only 24 cases, the sample size is small, and the distribution of cases by source selection method is unbalanced. Power calculations suggest the need for 14 cases for each source selection methodology (i.e., 14 LPTA cases and 14 tradeoff cases) in order to achieve adequate power ( $\alpha = .05$ ,  $\beta = .80$ ). The data are unbalanced with respect to the number of cases for each source selection methodology. There are 10 LPTA cases and 14 tradeoff cases. This unbalanced design can cause ambiguity about the mean as the intercept and make assignment of sums of squares more difficult. There are, however, solutions to these issues. A weighted mean can be used in place of the grand mean<sup>3</sup> and the STATA software automatically handles the assignment of the sums of squares. Thus, we proceeded with our analysis despite these issues.

## **C. ANALYSIS**

Because our intent is to analyze differences in contract outcomes (PALT and CPARS ratings) based on source selection methodology (LPTA or tradeoff), a group comparison statistical methodology is necessary. In other words, the source selection methods are divided into two groups (LPTA and tradeoff), and we seek to find if there are differences in contract outcomes (PALT and CPARS ratings) by group.

We used a technique called multivariate analysis of covariance, or MANCOVA, to assess group differences. MANCOVA essentially creates a new dependent variable using the information from the given dependent variables (PALT and CPARS rating). This new dependent variable is created in a way that maximizes differences between the grouping variable (LPTA or tradeoff source selections). MANCOVA addresses the following questions: Are mean differences among the groups on a combination of DVs (after adjusting for covariate effects) likely to have occurred by chance? Taken from another angle, is there a significant difference between the mean value for PALT and CPARS rating in the LPTA acquisitions versus the mean value for PALT and

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<sup>3</sup> The grand mean would be the intercept in a balanced design.

CPARS ratings in the tradeoff acquisitions, once the effects of the covariates (NUMEVALFACTORS, NUMREVIEWS, NUMOFFERS, VALUE) have been parceled out? MANCOVA examines the relationships between the dependent variables (PALT and CPARS ratings) and the independent variable (choice of LPTA or tradeoff methodology) while taking into account the effects the covariates might have on the dependent variables.

If differences in outcomes are found using MANCOVA, researchers typically choose to dig deeper into the differences using a univariate technique called analysis of covariance (ANCOVA). ANCOVA essentially performs the same group differences analysis as a MANCOVA, however because it is univariate in nature, this method assesses one DV at a time (PALT *or* CPARS, rather than PALT *and* CPARS). This method helps researchers isolate where the difference is occurring (which IVs or covariates are affecting which DVs). We use both MANCOVA and ANCOVA in this research.

#### **D. ASSUMPTION TESTING**

Before conducting the MANCOVA, certain assumptions about the data were tested. First, we assessed multivariate normality by examining density graphs, determining multivariate skewness and kurtosis, and by examining the Doornik-Hansen test for multivariate normality (Doornik & Hansen, 2008). For the DVs, both PALT and CPARS were deemed to be non-normal. Both variables were normalized via a logarithmic transformation. All of the covariates (NUMEVALFACTORS, NUMREVIEWS, NUMOFFERS, VALUE) also required a logarithmic transformation, after which all except NUMEVALFACTORS were deemed to be multivariate normal. We chose to drop the ill-behaved NUMEVALFACTORS covariate from all subsequent analyses, as “[c]ovariates are often included as a convenience in reducing error, but it is hardly a convenience if it reduces power” (Tabachnick & Fidell, 2007, p. 251).

Second, we searched for outliers using Mahalanobis’ Distance. We found no significantly influential outliers in our data.

Third, we assessed linearity by examining scatter plots of (1) the paired DVs, (2) all pairs of covariates, and (3) all pairs of DV-covariate combinations for each source selection method (LPTA and tradeoff, a total of 20 plots). The plots revealed that all relationships were linear in nature.

Fourth, we assessed homogeneity of regression by performing an analysis of variance (ANOVA, which is practically the same as an ANCOVA but does not contain a covariate variable) that included the independent variable (LPTA or tradeoff), each of the covariates (NUMREVIEWS, NUMOFFERS, VALUE), and the interaction between the independent variable and the covariate. When the interaction terms are not significant, the relationship between the dependent variables (PAL and CPARS ratings) and the covariates is the same at both levels of the independent variable (LPTA or tradeoff), upholding the assumption of homogeneity of regression. With our data, significant interactions were found between (1) PAL and VALUE, (2) CPARS and VALUE, and (3) CPARS and NUMREVIEWS. Because VALUE failed the test of homogeneity of regression for both DVs, it was completely dropped from further analysis. Further, NUMREVIEWS could not be included in the MANCOVA, as it failed the homogeneity of regression test for the CPARS outcome variable. Thus, NUMOFFERS is the only covariate that is available for the MANCOVA. It is important to note that we use NUMREVIEWS in an ANCOVA (univariate) assessment of the relationship between source selection methodology (LPTA or tradeoff) and PAL, as NUMREVIEWS did not fail the homogeneity of regression test for the PAL outcome variable.

Fifth, we checked for multicollinearity by assessing the pooled within cell tolerance for each DV (PAL and CPARS). Multicollinearity is not an issue for our data.

Finally, we checked for homogeneity of covariance matrices between groups (i.e., sphericity) using the multivariate test of means provided in STATA 12.1. This test checks whether or not population variances and covariances of both dependent variables (PAL and CPARS) are equal for each of the independent variable groups (LPTA and tradeoff). The results showed that all grouping cells were homogenous.

With all assumptions tested, we performed the MANCOVA (with only NUMOFFERS as a covariate) and subsequent ANCOVA. The results are provided below.

## **E. RESULTS**

### **1. MANCOVA**

The results show that source selection methodology (LPTA or Tradeoff) produced significantly different contracting outcomes at the  $p < .05$  level. See Table 2. Specifically, we found that tradeoff source selections produce higher CPARS ratings (23% higher CPARS score).

Breaking down the results further, we found that the NUMOFFERS submitted also serves to increase CPARS score (12% higher score for each percentage increase in NUMOFFERS,  $p < .10$ ). Table 2 shows the results of this analysis.

Table 2. MANCOVA Results—DVs: PALT and CPARS Ratings

<b>MANCOVA Results</b>						
<b>DVs: PALT and CPARS Rating</b>						
	<b>Coeff</b>	<b>SE</b>	<b>t</b>	<b>P&gt; t </b>	<b>95% CI</b>	
<b>PALT</b>						
LPTATO	.4635959	.3353186	1.38	.188	-.255591	1.182783
# Offers	.0856102	.2357787	0.36	0.722	-.4200848	.5913052
Constant	5.336645	.5807349	9.19	0.000	4.091093	6.582198
<b>CPARS</b>						
LPTATO	.2347992**	.0885981	2.65	0.019	.0447753	.4248231
# Offers	.1194312*	.0622976	1.92	0.076	-.0141838	-.2530462
Constant	.9350972	.1534421	6.09	0.000	.6059967	1.264198
	* $p < .10$ ** $p < .05$ *** $p < .01$ Number of Observations = 17 Root Mean Squared Error: PALT = .57 CPARS = .15 R <sup>2</sup> : PALT = .1231 CPARS = .3585					

### **2. ANCOVA**

Given that two covariates (NUMREVIEWS and NUMOFFERS) passed the homogeneity of regression test for the outcome variable PALT, we decided to conduct a

post-hoc analysis to see if there was a significant difference in PALT based on source selection methodology (LPTA or tradeoff). Again, because we are only using one DV (PALT), we are using the univariate method (ANCOVA), not the multivariate method (MANCOVA). The results of the ANCOVA show that no differences in PALT exist based on source selection method. However, the covariate NUMREVIEWS significantly increases PALT (65% increase when using the tradeoff method,  $p < .01$ ). This result is intuitive, as contract reviews add time to the procurement process and increasing the number of reviews will increase PALT. Typically, contract reviews are conducted consecutively and require approval before proceeding to the next step in the procurement process or to the next review. Table 3 shows the results of this analysis.

Table 3. ANCOVA Results—DVs: PALT

ANCOVA Results DVs: PALT						
	Coeff	SE	t	P> t	95% CI	
<b>PALT</b>						
#Reviews	.6543624***	.1767935	3.70	0.002	.2829331	1.025792
# Offers	.1433843	.1771919	0.81	0.429	-.2288821	.5156508
LPTATO	.1802472	.2665075	0.68	0.507	-.3796642	.7401586
Constant	4.51685	.3458353	13.06	0.000	3.790277	5.243422
	* $p < .10$ ** $p < .05$ *** $p < .01$ Number of Observations = 22 Root Mean Squared Error = .55236 $R^2 = 0.5551$ Adjusted $R^2 = 0.4810$					

Perhaps more telling are the relationships between the variables themselves. The correlations are given in Table 4. The lower triangle presents correlations of LPTA contracts, and the upper triangle presents correlations of tradeoff contracts.

Table 4. Correlation Data

Tradeoff LPTA \ PALT	PALT	CPARS	# Evaluation Factors	# Reviews	# Offers	Value
PALT	<b>1.00</b>	-0.6223	0.6692	0.7473	-0.0580	-0.0446
CPARS	0.6393	<b>1.00</b>	-0.4423	-0.4888	0.5523	-0.3941
# Evaluation Factors	0.2671	0.9118	<b>1.00</b>	0.9392	-0.0940	0.0388
# Reviews	0.7003	0.9966	0.8750	<b>1.00</b>	-0.0650	-0.1648
# Offers	0.8953	0.2298	-0.1901	0.3089	<b>1.00</b>	-0.6449
Value	0.9394	0.8641	0.5812	0.9025	0.6884	<b>1.00</b>

Variables with a correlation coefficient of +0.70 or greater indicates a strong positive linear relationship reaching perfect correlation at +1. Variables with a correlation coefficient of -0.70 or less indicates a strong negative linear relationship reaching perfect correlation at -1. A coefficient of 0 indicates that no relationship exists.

#### *a. LPTA Correlations*

CPARS and PALT have a moderately positive relationship at .6393. This suggests that taking additional time in the acquisition process (e.g., to craft the best solicitation possible, to ensure a thorough review of offers, to make a well-informed source selection decision, etc.) under an LPTA method leads to the selection of better performing contractors. Further, the almost perfect positive correlation between NUMREVIEWS and CPARS at .9966 indicates that more reviews lead to the selection of better performing contractors.

NUMEVALFACTORS and CPARS have a strong positive relationship at 0.9118. This is an interesting correlation because it suggests that increasing the number of evaluation factors leads to the selection of better-performing contractors. Factors under an LPTA method are evaluated based on pass or fail basis. The more factors there are, the more aspects of the technical and non-price areas of the requirement that are evaluated; therefore, this relationship suggests better performing contractors are able to pass more hurdles in terms of evaluation factors than less qualified contractors.

NUMREVIEWS and PALT have a strong positive relationship of .7003. This is an expected relationship, because each review takes time and all reviews are typically consecutive. Even though requirements using LPTA are less complex than tradeoff, additional reviews will increase PALT.

NUMOFFERS and PALT have a strong positive relationship of 0.8953. This result is also intuitive. The more proposals a source selection evaluation teams has to evaluate, the longer the PALT. Additionally, more offers could lead to increased exchanges with offerors through clarifications, communications, and additional rounds of discussions and resulting proposal changes, all of which serve to increase PALT.

VALUE and PALT have a strong positive relationship of 0.9394. This is likely the result of the fact that higher value contracts typically require more reviews because many regulatory procedures are based on, or triggered by, dollar thresholds. The strong positive relationship of .9025 between Value and the number of reviews also supports this relationship.

*b. Tradeoff Correlations*

Variables for tradeoff contracts did not exhibit similar correlation patterns as LPTA contracts. Overall, tradeoff variables exhibited more negative relationships.

CPARS and PALT have moderately negative relationships of -0.6223. It is not clear why an increase in PALT would lead to a lower CPARS rating and vice-versa. Additionally, NUMREVIEWS and CPARS also has a negative relationship ( $r = -.4888$ ). These results are opposite of the results observed under the LPTA method for the same relationships. It is unclear why this difference exists.

NUMEVALFACTORS and PALT have moderately positive relationships of 0.6692. This is likely an indication that increasing the number of evaluation factors increases the amount of time it takes the source selection team to complete proposal evaluations, thus increasing PALT. NUMREVIEWS also had a strong positive relationship with PALT of 0.7473, which is similar to the correlation for LPTA contracts.

This is expected because contract reviews typically increase the PALT regardless of the chosen source selection method.

Surprisingly, NUMEVALFACTORS and CPARS and NUMREVIEWS and CPARS have low negative relationships of -0.4423 and -0.4888, respectively. This is contrary to the strong positive relationship between these variables for LPTA contracts. These results are counterintuitive, as one would theoretically expect a higher number of evaluation factors and reviews to yield a better-performing contractor. More data is needed to determine the stability and significance of these negative relationships.

NUMOFFERS and CPARS have moderately positive relationships of 0.5523. This is intuitive based on the expectation that more offers provides the SSA with more options to choose from, which leads to a better chance of selecting a high-performing contractor.

Our analysis presented some unexpected results for the tradeoff correlations. More data and further analysis are necessary to check the stability of these results.

## **F. SUMMARY**

This chapter discussed the data analysis and results using MANCOVA and ANCOVA techniques. It also included some post-hoc analyses which looked closer at the relationships between covariates and contract outcomes. An examination of the relationships between some of the covariates and contract outcomes identified areas for further research. The next chapter will provide our conclusions and recommendations based on our findings.

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## **V. CONCLUSIONS**

This chapter summarizes the purpose, analysis, and findings of this research, and answers the research questions posed in Chapter I. The chapter concludes with recommendations for further research.

### **A. SUMMARY**

As stewards of taxpayer dollars, government acquisition teams have an obligation to provide the best value for products and services required by their customers. While conducting a successful source selection is a critical part of the acquisition process, the ability to achieve best value is affected by the activities performed during all the phases of the federal contract management process. Within the DOD, LPTA and tradeoff are the two most widely used source selection methods on the best value continuum. The trend for utilizing LPTA in the DOD increased over the past few years along with sharp criticism of the method by the defense industry. Contractors maintain that the DOD is using the LPTA method inappropriately and that it robs the government of high quality products and services and innovative solutions. The GAO disputes these claims, offering report findings that assert the DOD is using the method appropriately. Currently, there is no empirical evidence that links the utilization of the LPTA source selection method to poor contractor performance outcomes or the use of the tradeoff method to good performance outcomes. The objective of this research was to determine whether the source selection method employed by the Air Force, either LPTA or tradeoff, affects the time-to-contract metric (PALT) and/or the contractor's performance (as measured by CPARS).

### **B. CONCLUSION**

Based on our results, we can now answer the research questions that were presented in Chapter I:

1. What is the relationship between a particular source selection method and the resulting performance outcome of the contractor?

For the first question, our analysis supports that a relationship exists between a particular source selection method (LPTA or tradeoff) and the resulting contractor performance outcome. We found that source selections conducted under the tradeoff method produced higher performance outcomes as measured by CPARS. Additionally, we found that there is a positive relationship between the number of offers submitted and the performance outcome of the contractor as measured by CPARS. In other words, the more competitive the acquisition, the better the performance outcome of the selected contractor.

2. What is the relationship between a particular source selection method and the PALT?

i. If there is a positive relationship, can the amount of additional resources utilized for that particular source selection method be quantified in terms of man-hours or in dollars?

For the second question and its first sub-question, our analysis does not support a relationship between a particular source selection method and the PALT. Nonetheless, there are covariate factors that can affect the PALT. For example, the number of reviews positively impacts the PALT under both LPTA and tradeoff source selection methods, which means that the more reviews there are, the longer time it takes to get to award. As a second example, the number of offers affects the PALT positively when using LPTA but slightly negatively when using tradeoff. More specifically, the greater the number of offers to evaluate under an LPTA source selection, the longer it takes to get to award, yet greater numbers of offers under a tradeoff source selection slightly reduces time to award. Clearly, this ambiguous finding requires further research to disentangle.

ii. Does the resulting performance outcome merit the use of that particular source selection method?

Since our research seems to support the fact that a contractor selected through the tradeoff method has higher performance outcomes than under LPTA, the answer to this sub-question is yes, the tradeoff method produces better performance, based on CPARS scores. Moreover, since PALT is not affected by the source selection method, there is no reason to shy away from the use of the tradeoff method to achieve better contractor

performance. Clearly, these results are specific to our data, and the collection of additional data is necessary to confirm these findings.

### **C. RECOMMENDATIONS FOR FURTHER RESEARCH**

This research project produced some interesting results with data collected from the AFLCMC, which is only one center within an Air Force MAJCOM (AFMC) known for its prominence in acquisitions. We recommend that additional data be collected and analyzed to confirm the findings of our research. Furthermore, due to time and manpower constraints, and the fact that the AFLCMC customarily engages in sole source contracts, it was difficult for us to collect a well-balanced and statistically powerful amount of data. We recommend repeating this research in its entirety with a larger sample size and data representing all the organizations in AFMC.

Since the AFMC consists of mostly systems level procurements, it would be beneficial to repeat this research across the Air Force and other agencies to assess the outcomes for different types of requirements across the DOD. The results may vary according to the type of requirement (i.e., construction, services, and commodities). Understanding these relationships across the various requirement types can help acquisition teams plan their acquisition strategy in a way that cuts waste and streamlines the acquisition process while still achieving best value.

Our final recommendation is to devise a research project focused on quantifying the amount or level of resources consumed during the course of a procurement process from beginning to end. We expected to find a significant relationship between source selection method and PALT due to the fact that average PALT for tradeoff is double the average PALT for LPTA, however our results did not support such a relationship.

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## APPENDIX A. BUSINESS SECTOR, DOLLAR THRESHOLD AND REVIEWING OFFICIAL (FROM CPARS, 2015)

	Dollar Threshold <sup>1</sup>	Reviewing Official <sup>2</sup>
<b>Civilian Agencies (excludes DOD):</b>		
<b>Systems and Non-Systems</b>	>Simplified Acquisition Threshold	One level above the contracting officer, as determined by department or agency policy
Architect-Engineer	≥\$30,000; All Terminations for Default	One level above the contracting officer, as determined by department or agency policy
Construction	≥\$650,000; All Terminations for Default	One level above the contracting officer, as determined by department or agency policy
<b>DOD Services and Agencies: Systems</b> (includes new development and major	>\$5,000,000	One level above the PM <sup>3</sup>
<b>Non-Systems</b>		
<b>Operations Support</b>	>\$5,000,000 <sup>4</sup>	One level above the AO
<b>Services</b>	>\$1,000,000	One level above the AO
<b>Information Technology</b>	>\$1,000,000	One level above the AO
<b>Ship Repair and Overhaul</b>	>\$500,000	One level above the AO
Architect-Engineer	≥\$30,000; All Terminations for Default	One level above the AO
Construction	≥\$650,000; All Terminations for Default	One level above the AO

<sup>1</sup>The contract/order thresholds for CPARS collection (see FAR 42.1502) apply to the “aggregate” value of contracts/orders; that is, if a contract’s/order’s original award value were less than the applicable threshold but subsequently the contract/order was modified and the new value is greater than the threshold, then evaluations are required to be made, starting with the first anniversary that the contract’s/order’s face value exceeded the threshold. If the total contract/order value including unexercised options and orders (for IDIQ contracts, total estimated value of unexercised options and orders) is expected to exceed the collection threshold, initiate the collection process at the start of the contract/order. Buying activities may choose to collect performance evaluations for awards below these thresholds.

<sup>2</sup>Only required when the contractor indicates non-concurrence with the CPARS or if otherwise requested by the contractor during the 60-calendar day comment period.

<sup>3</sup>(Or equivalent individual) responsible for program, project or task/job order execution.

<sup>4</sup>For contracts/orders under the reporting thresholds, buying activities should continue to accumulate contractor performance data from existing management information systems, which already capture data on timeliness of delivery and quality of product or service (an example of a performance information collection systems is the Past Performance Information Retrieval System—Statistical Reporting Module)

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## APPENDIX B. EVM REQUIREMENTS (FROM OUSD[AT&L], 2015)

REQUIREMENTS	WHEN REQUIRED <sup>1</sup>	SOURCE
<b>For Cost/Incentive Contracts<sup>2</sup> ≥ \$50 Million<sup>3</sup></b>		
- Compliance with EVM system guidelines in ANSI/EIA-748 <sup>4</sup>	At contract award and throughout contract performance	Part 7 of Office of Management and Budget (OMB) Circular A-11 (Reference ©) This instruction
- EVM system formally validated and accepted by cognizant contracting	At contract award and throughout contract performance	
- Integrated Program Management Report (IPMR) (DI-MGMT-81861 <sup>5</sup> )	Monthly	
- Integrated Baseline Reviews	Within 180 calendar days after contract award, exercise of options, and major	
<b>For Cost/Incentive Contracts<sup>2</sup> ≥ \$20 Million<sup>3</sup> but &lt; \$50 Million<sup>3</sup></b>		
- Compliance with EVM system guidelines in ANSI/EIA-748 <sup>4</sup>	At contract award and throughout contract performance	Part 7 of OMB Circular A-11 This instruction
- IPMR (DI-MGMT-81861 <sup>5</sup> ) (tailoring of formats recommended)	Monthly	
- Integrated Baseline Reviews	Within 180 calendar days after contract award, exercise of options, and major	
<b>For Cost/Incentive Contracts<sup>2</sup> &lt; \$20 Million<sup>3</sup></b>	At the discretion of the Program Manager based on cost-benefit analysis	Part 7 of OMB Circular A-11 This instruction
- IPMR, Format 6 (DI-MGMT-81861 <sup>5</sup> )	At the discretion of the Program Manager based on Government requirements	Part 7 of OMB Circular A-11 This instruction
<b>For Firm Fixed-Price Contracts<sup>2</sup> regardless of</b>	Limited Use—will be approved by the MDA based on a business case analysis	
- IPMR, Format 6 (DI-MGMT-81861 <sup>5</sup> )	At the discretion of the Program Manager based on Government requirements	Part 7 of OMB Circular A-11 This instruction
<p>Notes:</p> <ol style="list-style-type: none"> <li>1. EVM is required, as outlined in the table, unless the EVM requirement has been waived by the CAE per paragraph 6c in Enclosure 2.</li> <li>2. The term, "Contracts," includes contracts, subcontracts, intra-government work agreements, and other agreements. For Indefinite Delivery/Indefinite Quantity contracts, EVM will be applied to the individual task orders or group of related task orders in accordance with the requirements in this table. "Incentive" contracts include fixed-price incentive. EVM is required for Fixed-Price Incentive Fee development and integration contracts with measurable and discrete work scope. In cases where the work scope is not measurable and discrete, program offices should follow the process to obtain a DFARS deviation.</li> <li>3. Application thresholds are in then-year dollars.</li> <li>4. ANSI/EIA-748 = American National Standards Institute (ANSI)/Electronic Industries Alliance (EIA) Standard 748, Earned Value Management Systems (Reference (au)).</li> <li>5. DI-MGMT-81861 = DID: Integrated Program Management Report (Reference (av)) <ul style="list-style-type: none"> <li>a. If EVM is not required or a deviation is obtained, the IPMR should be used and tailored to obtain cost and/or schedule reporting when desired by the Government. For example, for full rate production contracts where EVM is not applicable, a tailored IPMR including a cost report showing actuals and a top-level schedule providing delivery dates of end products would be sufficient for Government management and oversight.</li> <li>b. Flow-down of the IPMR DID to the subcontractors is at the discretion of the program office.</li> </ul> </li> </ol>		

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